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1896

Fourth Annual Report

OF THE

State Board of Education

OF THE

STATE OF MONTANA.

TO HIS EXCELLENCY,

JOHN E. RICKARDS,

GOVERNOR OF MONTANA.

NOVEMBER 30, 1896.

HELENA, MONTANA:
STATE PUBLISHING COMPANY,
STATE PRINTERS AND BINDERS,
1897.

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MEMBERS
OF THE
STATE BOARD OF EDUCATION
1896.

EX-OFFICIO.

Gov. J. E. RICKARDS, President.

H. J. HASKELL, Attorney General.

E. A. STEERE, Supt. Public Instruction, Secretary.

BY APPOINTMENT.

J. E. MORSE, Dillon,	- - -	Term expires February 1, 1897.
T. E. COLLINS, Great Falls,	- - -	Term expires February 1, 1897.
J. M. HAMILTON, Missoula,	- - -	Term expires February 1, 1898.
H. H. GRANT, Grantsdale,	- - -	Term expires February 1, 1898.
PETER WINNE, Helena.	- - -	Term expires February 1, 1899.
O. F. GODDARD, Billings,	- - -	Term expires February 1, 1899.
JAMES REID, Bozeman	- - -	Term expires February 1, 1900.
J. A. BAKER, Butte,	- - -	Term expires February 1, 1900.

Clerk of the Board:

CAMERON C. WYLIE, HELENA.

FOURTH ANNUAL REPORT.

To His Excellency, JOHN E. RICKARDS,
Governor of Montana.

Sir: In compliance with the provisions of the statutes, we have the honor to submit herewith a brief statement of the work of this Board for the year ending November 30, 1896.

MEETINGS.

The following meetings have been held:
December 20, 1895; Febraury 10, 1896; March 23, 1896; June 1, 1896; June 29, 1896; August 7, 1896.

You are aware of the changes made in the membership of the Board caused by the expiration of the term of Hon. A. H. Wethey, and the retirement of Prof. R. G. Young; and the appointment of Hon. J. A. Baker and Hon. Peter Winne, respectively to succeed them.

The term of Rev. James Reid having expired last February, he was appointed to succeed himself.

STATE ARGRICULTURAL COLLEGE.

An examination of the report of the Executive Board and the President of the College, herewith submitted, will give you full information concerning the College so far as the same has been under their immediate direction and control.

We heartily indorse the recommendations therein made and trust the Legislature will give them careful consideration and place the means in our hands with which to carry them out.

STATE UNIVERSITY.

The report of the President, herewith submitted, gives in detail the work of that Institution for the past year.

We commend the recommendations made and believe they will receive thoughtful consideration by the Legislature soon to convene.

So far as the attendance of students in the College and University is concerned, its prosperity exceeds the expectations we had cherished. We cannot but be gratified. The faculties are composed of able and earnest men and women, thoroughly devoted to their work, and managing with efficiency and wisdom the interests confided to their care.

But while rejoicing in the progress that has been made and in the results attained, we feel that these cannot long be continued without that assistance from the State which is needed and of right is expected.

The needs of the University are more pressing because of its entire dependence upon the State for support. Unlike the Agricultural College it has no Federal appropriation with which to meet its running expenses. The revenues received from the sale and leasing of University lands have so far paid almost entirely the expenses incurred from the date of opening of the University. But the greater part of this fund had accumulated prior to the date of opening and the entire amount is now exhausted.

Considering that for the last eleven months the receipts for this fund have aggregated but \$4,718.16, it will be seen that the yearly revenue from such source constitutes but a small part of the funds necessary to establish and successfully operate a State University.

If Montana is to have a University commensurate with her eminence among her sister states and a credit to her people, one that will furnish to her sons and daughters opportunities for thorough and generous training, she must, with generous hand, bestow that aid which will make such results possible. We cherish the hope that this will be done.

STATE NORMAL SCHOOL.

By virtue of an act of the Fourth Legislative Assembly, authorizing the issuance of \$50,000 worth of bonds, secured by the State Normal School land grant, these bonds were issued and sold and the full amount has been received.

The erection of a \$37,000 building was commenced in November, 1895, and it is expected this building will be completed by January, 1897.

Owing to a total lack of funds with which to operate the School the Board has refused to open it. This is a matter that should early be brought to the attention of the Legislature, for until that body makes provision for the running expenses of the School, we deem any action looking to its opening to be unwise.

STATE SCHOOL OF MINES.

A suitable selection has been made for a site and a \$100,000 building is now in course of erection. This building will be ready for occupancy by September, 1897.

The funds for the building and furnishing are procured from the sale of warrants secured by lands granted to the School, by act of Congress. The funds for its maintenance must be supplied by the State.

We do not feel that it is necessary to dwell upon the great importance of this School to our State. Montana needs the School, the young men need its instruction and the mining interests need the trained young men as experts in the mines. There will be more and more demand for these skilled men as the vast mineral resources of our State are more developed.

STATE AND LIFE DIPLOMAS.

We have held during the past year two examinations of applicants for state and life diplomas. The first was held at Anaconda December 30 and 31, 1895, and January 1 and 2, 1896, and the following named persons were issued state diplomas, they having passed the examination in all subjects required by the Board:

J. W. Dale, Boulder; A. J. Walrath, Bozeman.

The next examination was held at Helena June 26 and 27, and the following named persons were issued life diplomas having passed the examination in all the subjects required by the Board:

J. W. Dale, Boulder; A. J. Walrath, Bozeman.

At a meeting of the Board held on February 11, 1896, the following named persons were granted life diplomas without examination:

Earl Douglass, Logan; E. A. Cromer, Butte; Alta L. Westbrook, Butte; Agnes M. Trost, Glendive.

At the same meeting the following named persons were granted state diplomas without examination:

J. F. Davies, Butte, diploma expires February 11, 1902.

Gertrude Reifenrath, Helena, diploma expires February 11, 1902.

Mary A. Reese, Anaconda, diploma expires February 11, 1902.

Alice E. Porterfield, Bozeman, diploma expires February 11, 1902.

Jennie Carpenter, Helena, diploma expires February 11, 1902.

Roberta Robinson, Deer Lodge, diploma expires February 11, 1902.

Anna M. Sutherland, Anaconda, diploma expires February 11, 1902.

W. G. Light, Great Falls, diploma expires February 11, 1902.

Millie J. Coffin, Dillon, diploma expires February 11, 1902.

At a meeting of the Board held March 23, 1896, the following named persons were granted life diplomas without examination:

Jennie C. Robinson, Butte.

Ella Orr, Butte.

At a meeting of the Board held June 1, 1896, life diplomas were granted to the following named persons without examination:

D. C. VanBuren, White Sulphur Springs.

B. C. Hastings, Helena.

Emma McHenry Glenn, Helena.

Nellie M. Darby, Dillon.

Lewis Terwilliger, Townsend.

Anne Douglas, Anaconda.

Virginia Douglas, Anaconda.

At the same meeting state diplomas were granted without examination to the following named persons:

Josie B. Duke, Gardiner.

C. W. Birchard, Twin Bridges.

At a meeting of the Board held June 29, 1896, a life diploma was granted without examination to Delia Dorchester, Helena; a state diploma was granted without examination to Clara Corbin, Butte, diploma expires June 29, 1902.

INSTITUTE INSTRUCTOR'S CERTIFICATES.

At the meeting of the Board held June 1, 1896, institute instructor's certificates were issued to the following named persons:

M. S. Cummins, Helena.

Laura E. Howey, Helena.

ACCREDITED HIGH SCHOOLS.

The Board at its meeting held June 1, 1896, took the following action:

1. Candidates seeking admission to any of the regular courses in any State Educational Institutions must be at least sixteen years of age and must possess a good moral character and good bodily health.

2. Accredited Schools.—Any high school or academy whose course of instruction covers the branches requisite for admission to one or more of the courses of any State Educational Institution may be admitted to its accredited list of preparatory schools, after a satisfactory examination by a committee appointed by the State Board of Education. Application for such examination may be made by any school board to the Secretary of the State Board of Education, whereupon a committee appointed by the State Board of Education will examine the course of study and methods of instruction of the

school, and on the committee's favorable recommendation, and the concurrence of the State Board of Education, it will be entered upon the accredited list of the State Educational Institution for which it applied. Any graduate of such an approved school will be received by the President of the State Educational Institution wherein said graduate is entitled to enter, on presentation of proper diploma and certificate from the Superintendent of said School, into any of the courses of said institution for which said graduate has been fitted.

Students of an accredited school who are not graduates must expect examinations as other candidates.

A school once entered upon the accredited list will remain there until its administration is changed, or until notice is given by the State Board of Education of unsatisfactory results. Upon a change of administration application for continuation upon the list, if desired, must be made. If the work of the principal coming into charge has been recently examined in connection with some other school, a new examination may not be required, but such examination should in all cases be invited.

Annual reports will be asked for by the State Board of Education from all accredited schools.

LIST OF ACCREDITED SCHOOLS.

CITY.	SUP'T.
Helena.....	J. E. KLOCK.
Butte.....	F. L. KERN.
Great Falls.....	S. D. LARGENT.
Anaconda.....	M. A. STAPLETON.
Missoula	J. M. Hamilton.

STATE EXAMINATIONS.

Questions prepared by State Board of Education for examination held at Anaconda, December 30 and 31, 1895, and January 1 and 2, 1896.

FOR STATE DIPLOMA.

Algebra.

(YOUNG.)

I.

What is a term? Give the double meanings of the signs— and +. What are the signs of aggregation? Give rules for removing parenthesis.

II.

Give rules for subtraction and explain the principles upon which it is based. Explain the law of signs in Multiplication. Simplify :

$$(X^2+1)-[AX-\{ -(-2AX+7)-\overline{AX-X^2-7} \}+2X^2].$$

III.

Factor the following—

$$(a) \quad dxy-cxy+cdx^2-y^2.$$

$$(b) \quad 12c^2+7c-12.$$

IV.

Express in their simplest form :

$$\left\{ \frac{1-A^2}{1-A^3} + \frac{1-A}{1-A-A^2} \right\} \div \left\{ \frac{1+A}{1+A+A^2} - \frac{1-A^2}{1+A^3} \right\}$$

Three persons purchased sugar, coffee, and tea at the same rates A paid \$4.20 for 7 pounds of sugar, 5 pounds of coffee and 3 pounds of tea; B paid \$3.40 for 9 pounds of sugar, 4 pounds of coffee, and 2 pounds of tea; C paid \$3.25 for 5 pounds of sugar, 2 pounds of coffee, and 3 pounds of tea. What was the price of each per pound?

VI.

A man going from a certain place traveled at the rate of 5 miles an hour. After he had been gone 6 hours, a horseman, going at the rate of 8 miles an hour, was sent after him. How far did the latter travel before overtaking the former?

VII.

Find the value of x :

$$\frac{2x}{x+3} + \frac{x}{x-5} - 3 = \frac{1}{2x-10}$$

VIII.

A picture, which is 18 inches by 12, is to be surrounded by a frame of uniform width, whose area is equal to that of the glass. What is the width of the frame?

IX.

What is the Binomial Theorem? By it find the ninth term of $(a+b^2)^{12}$.

X.

Find the value of the unknown quantities:

$$\left\{ \begin{array}{l} x+y + \sqrt{x+s} = 6 \\ x^2+y^2=10 \end{array} \right\}$$

Geometry.

(YOUNG.)

I. Define locus of a point. What is the locus of a point ;

[a] At a given distance from a fixed point ?

[b] At a given distance from an indefinite straight line ?

[c] Equidistant from extremities of a given line.

II. What is the sum of the exterior angles of a polygon ?
Demonstrate.

III. Upon a given straight line construct a segment of a circle which shall contain a given angle.

IV. Name the several sets of conditions under which triangles are equal ; under which they are similar.

V. [a] The areas of two similar polygons are to each other as the squares of their homologous sides. Demonstrate.

[b] What other proportions exist between similar polygons or their parts ?

VI. Construct a square equivalent to a given parallelogram.

VII. Find the side of a square equivalent to the difference of two squares whose sides are respectively 24 feet and 40 feet.

VIII. Inscribe a regular decagon in a circle. Demonstrate.

IX. What is the width of a ring between two concentric circumferences whose lengths are 440 feet and 330 feet ?

X. If in a right triangle a perpendicular is drawn from the vertex of the right angle to the hypotenuse, what proportions follow ? Demonstrate.

Arithmetic.

(YOUNG.)

I.

Bought $5\frac{1}{8}$ cords of wood at \$4.00 a cord, but found the wood had been cut 3 inches less than 4 feet in length. How much reduction should have been made from the bill?

II.

If \$21.75 keep eight persons for $7\frac{1}{2}$ weeks when flour is \$6.40 a barrel, how many weeks will \$29.00 keep them when flour is \$11.25 a barrel. Analyze solution.

III.

Simplify:

$$(48 - 4 \times 3 + 16 \div 4) - \{ 10x[9 \div 3 + (15 - 3 \times 5) \div 8] + 1 \} =$$

IV.

I have a conical hay stack whose slant height is $8\frac{3}{4}$ feet, and the diameter of the base is $6\frac{1}{2}$ feet, how many square yards of canvas will cover it?

V.

For how much must I draw my note at 90 days in order that when discounted at the bank at 7%, its proceeds will pay for $137\frac{3}{4}$ yards of cloth at \$2 $\frac{5}{8}$ per yard?

VI.

(a) $\frac{2}{3}$ of $\frac{1}{5}$ of what number, diminished by $\frac{\frac{1}{2} \text{ of } \frac{1}{5}}{2\frac{1}{4} + \frac{7}{8}}$, leaves $\frac{(4\frac{1}{8})^3 - 1}{(4\frac{1}{4})^3 - 1}$?

(b) I sent \$4510 to my agent in Chicago, who purchased grain at an average price of \$1.10 per bushel, and charged me $2\frac{1}{2}\%$ commission. How many bushels did he buy?

VII.

A cream can is fifteen inches in diameter and three feet deep. How many quarts will it hold?

VIII.

How much farther is it by the boundary line, from one corner of a square forty-acre lot to the opposite corner than by the diagonal?

IX.

How many feet of boards are actually used in making a crib $40\frac{1}{2}$ ft. long, $6\frac{1}{2}$ ft. wide and $12\frac{1}{2}$ feet high, the roof being flat, and projecting 3 inches on each side, what will it cost to tin the roof at \$3.25 a square?

X.

The expense of building a public bridge was \$1,260.52, which was defrayed by a tax upon the property of the town. The rate of taxation was $3\frac{1}{4}$ mills on \$1, and the collector's commission was $3\frac{1}{2}$ per cent; what was the valuation of the property?

Physiology.

[STEERE.]

- I. Define physiology.
 - II. Define anatomy.
 - III. Give the route by which chyle enters the circulation.
 - IV. Describe the changes produced in blood by respiration and tell how the changes take place
 - V. What are the physical changes in a muscle during its action.
 - VI. [a] Explain a case of reflex action of the spinal cord.
[b] How would you illustrate this subject before a class?
 - VII. Describe the apparatus for hearing, and explain its operation.
 - VIII. [a] State two laws of health that should be taught to a class studying the muscular system.
[b] Two, to a class studying the nervous system.
 - IX. Give full description of the brain, stating [a] constituents, [b] structure, [c] color, [d] weight.
 - X. [a] What vein begins and ends with capillaries?
[b] Is severe mental labor compatible with a rapidly-growing body? Give reason.
-

Phys. Geography.

[STEERE.]

- I. [a] Name the three geyser districts of the world.
[b] Describe a geyser.
- II. Why is the earth's interior thought by some to be solid rather than liquid?
- III. [a] Name two causes of volcanic action.
[b] How are mountains formed?
- IV. [a] What are isothermal lines?
[b] Why do they not coincide with parallels of latitude?
- V. Explain why all rivers do not have deltas. Name one which has no delta.
- VI. Explain the rotation and forward motion of cyclones.
- VII. Under what conditions are coral islands formed?
Where are they found?
- VIII. State where trade winds blow, and explain their cause.
- IX. Give approximately the next date when the sun's rays will be vertical at [a] the Equator; [b] the Tropic of Cancer; [c] the tropic of Capricorn.
- X. [a] What is the greatest latitude and the greatest longitude a place may have? Explain answer.
[b] The latitude of Sitka is 57° N., and that of Louisville is 38° N.; the average temperature of these two places is nearly equal. Explain.

U. S. History.

[HAMILTON.]

- I. What was the extent of the English possessions in North America in 1689? In 1775? In 1895? Account for the changes.
 - II. Name all of the colonies which were settled by persons fleeing from religious persecution. By whom was each of these colonies settled? Who were the persecutors?
 - III. What was the Ordinance of 1787? Name the two most important provisions of that Ordinance.
 - IV. State the principal features of Alexander Hamilton's financial policy.
 - V. What was the Monroe Doctrine? Describe briefly the events which led to its promulgation.
 - VI. State the issue and the result in each of the following battles: Quebec, Bunker Hill, Gettysburg.
 - VII. What were the political views held by Daniel Webster and John C. Calhoun respectively?
 - VIII. Give a brief review of what is known as the "Alabama Claims."
 - IX. For what purpose was the Electoral Commission of 1876 formed? Of whom was it composed? What was the result of its official deliberations and declarations?
 - X. Explain the provisions of the law effecting silver that were passed in 1873. In 1878. In 1890. In 1893.
-

Physics.

[STEERE.]

- I. [a] Define and give an example of a physical change.
[b] Of a chemical change.
- II. [a] Distinguish between gravitation and gravity.
[b] Define weight.
- III. Explain the parallelogram of forces.
- IV. Explain all the physical laws or phenomena involved in weighing an article with steelyards.
- V. What is the difference between the temperature 40 degrees C. and 40 degrees F.?
- VI. If a body weigh 120 pounds 2,500 miles below the surface of the earth, at what distance above the surface will it weigh 80 pounds?
- VII. [a] Describe an electro-magnet.
[b] State the principle of the electric telegraph.
- VIII. What is the pressure on the side of a reservoir 150 feet long, filled with water to the height of twenty feet?
- IX. A capstan 14 inches in diameter, has four levers each 7 feet long. At the end of each lever a man is pushing with a force of 42 pounds. What is the effect produced?
- X. [a] What is the law of intensity of illumination?
[b] If you can just see to read by moonlight and also by a lamp 15 feet away, how much brighter is the moon than the lamp?

Civil Government.

[REID.]

- I. [a] How are the President and Vice President of the United States elected? [b] When the election goes to Congress, by whom is each elected?
 - II. [a] What is the salary of the Governor of Montana? [b] By what authority is it fixed? [c] How may it be changed?
 - III. Who are the cabinet officers?
 - IV. State the qualifications of United States Senators.
 - V. [a] Name the commander in chief of the state militia. [b] Of the United States Military forces.
 - VI. Distinguish between direct and indirect taxation.
 - VII. Give the main features of the government survey of Western lands.
 - VIII. What are the qualifications of voters in Montana?
 - IX. [a] Name the county officers. [b] City officers.
 - X. What are the state institutions of higher education and where are they located?
-

Theory and Practice.

[HAMILTON.]

- I. State the main features of the Herbartian system of pedagogy.
- II. Name the objects of the recitation.
- III. Outline a good method of teaching reading to beginners.
- IV. Explain how the following intellectual powers may be cultivated by the study of geography: Observation, imagination, reasoning.
- V. What changes were recommended in the subject matter and methods of teaching mathematics below the high school in the report of the Committee of Ten.
- VI. What is the object in the study of technical grammar? When should the study of it begin?
- VII. What are the evil effects of written examinations? The good results?
- VIII. What use should a teacher make of the text book?
- IX. What is meant by the inductive method of teaching? The Socratic method?
- X. Name five qualities that belong to the successful teacher.

Grammar.

[YOUNG.]

- I. Analyze the following sentence and parse the italicized words :

*Happier to chase a flying goal
Than to sit counting laurelled gains,
To guess the soul within the soul,
Than to be Lord of what remains.*—Lowell.

- II. Construct sentences containing five different kinds of elements, each being of the second class; indicate and tell the kind of element in each sentence.

- III. Give the synopsis of the verb "drive" in the second person, singular number in the regular, emphatic, progressive and interrogative forms.

- IV. Diagram the following and parse the italicized words :

*Ay, call it holy ground,
The soil where first they trod,
They have left unstained what there they found,
Freedom to worship God.*—Mrs. Hemans.

- V. What is a primitive word? What is a derivative word? What is a suffix? What is a prefix? Indicate the diacritical marks and the accent in the following words: Primary, admirable, dictionary, incomprehensible, depot, longitude. Tell what information can be gained about a word by reference to a dictionary.

- VI. Name the auxiliary verbs and tell their use. Give the participles in both the active and passive forms that can be derived from the verbs: See, teach, love, kill, pay, help.

- VII. Punctuate and capitalize the following:

man is a two-legged animal without feathers plato plato having defined man to be a two-legged animal without feathers he diogenes plucked a cock and bringing him into the school said here is platos man from which there was added to the definition with broad flat nails diogenes laertius.

- VIII. Write sentences using pronouns in the [a] nominative case [1] as subject, [2] as predicate, [3] by apposition, [4] after an infinitive: [b] objective case, [1] as object of a verb, [2] as object of a preposition, [3] as subject of an infinitive: [c] nominative absolute by exclamation. Give rules for forming the possessive cases of nouns.

- IX. What is poetry? What is prose? What is rhyme? What is a verse? Scan the following:

“—He crew at dawn a cheerful note,
To wake the gods and heros to their tasks
And all the gods and all the heroes woke.
And from their beds the heroes rose and donned
Their arms, and led their horses from the stall,
And mounted them, and in Valhalla’s court
Were ranged; and then the daily fray began,
And all day long they there were hacked and hewn
‘Mid dust and groans, and limbs lopped off and blood;
But all at night return to Odin’s hall
Woundless and fresh; such lot is their’s in heaven.

- X. Give the rules of syntax relating to the verb and illustrate each. Write a sentence with a participle used [1] as a noun, [2] as an adjective, [3] as an adverb, [4] as an appositive.

English Literature.

[REID.]

- I. What are the three periods of English Literature ?
 - II. To what period did Geoffrey Chaucer belong, and name his chief work.
 - III. Who wrote the Faerie Queen? The Defence of Poesie? The Vision of Piers Plowman?
 - IV. Give the time of the Miracle Plays and Mysteries and explain them.
 - V. Give a sketch of Wm. Shakespeare, and give a list of his principal dramas and comedies.
 - VI. What is Milton's place as a poet and prose writer, and name his greatest works.
 - VII. Who wrote the Pilgrim's Progress and give a brief sketch of the work.
 - VIII. Who wrote Robinson Crusoe and give a sketch of it.
 - IX. [a] Give a short sketch of Samuel Johnson, [b] of Oliver Goldsmith, [c] of Sir Walter Scott.
 - X. Name the chief novelists and poets of the Victorian Era.
-

Mental Science.

[REID.]

- I. [a] How does knowledge begin? [b] Through what stages does it pass?
- II. Name and classify the mental faculties.
- III. [a] Distinguish between sensation and reflection. [b] Define perception, apperception.
- IV. [a] What is habit? [b] How is it related to attention?
- V. In what three ways does memory manifest itself?
- VI. Define imagination.
- VII. What are some of the results of training the powers of observation?
- VIII. Define reasoning and illustrate.
- IX. What is volition?
- X. State the importance of Child study to the teacher and name some of the best books on the subject.

School Laws of Montana.

[STEERE.]

- I. What duties does the school law require of the teacher?
- II. What duties does the law require of the County Superintendent of Schools in providing for his annual institute?
- III. [a] For what may women vote in Montana?
[b] What qualifications must a woman possess to vote?
- IV. [a] How many members are there in the State Board of Education?
[b] How do they obtain their membership?
- V. [a] Give the composition of a district board of school trustees.
[b] When elected and term of office.
- VI. What is the amount of the library fund in this State for the different districts?
- VII. What are the requirements for the renewal of a teacher's certificate without examination?
- VIII. The law for compulsory attendance says that "children between the ages of eight and fourteen years, shall be required to attend school at least twelve weeks in each year."
[a] Who may excuse them from such duty?
[b] Name three statutory provisions upon any one of which the excuse must be based.
- IX. A school district lies partly in two counties. The school board of said district wishes to hire a teacher. From which county must the teacher hold a certificate?
- X. Give the following qualifications for State Superintendent:
[a] Educational.
[b] Age.
[c] Residence.

Advanced Algebra.

[YOUNG.]

I.

Factor the following:

$$81x^4 + 20x^2y^2 + 4y^4$$

II.

Multiply the H. C. F. of $3x^3 - x^2 - 2x - 16$ and $2x^3 - 2x^2 - 3x - 2$ by the L. C. M. of $4C^2 - 9$, $6C^2 - 5C - 6$, and $6C^2 + 13C + 6$.

III.

Simplify the following:

$$\frac{A^2 - b^2}{Ab^2 \times} \times \frac{b(A-b)}{A^2 + 2Ab + b^2} \times \frac{b(A+b)}{A^2 - 2Ab + b^2}$$

IV.

It is required to divide the number 96 into three such parts that if we divide the first by the second the quotient shall be 2, with three for a remainder; but if we divide the second by the third, the quotient shall be 4, with 5 for a remainder. What are the three parts?

V.

Find the value of the unknown quantities:

$$\left\{ \begin{array}{l} x+y=9 \\ y+z=11 \\ z+w=13 \\ w+u=15 \\ u+x=12 \end{array} \right\}$$

VI.

Find the cube root of:

$$M^3 - 3M^2 + 5 - \frac{M^2}{M^3}$$

VII.

Divide $2x^{\frac{2}{3}}Y^{-\frac{1}{3}} - 20 + 18x - \frac{2}{3}Y$, by $x^{\frac{2}{3}}Y^{-\frac{1}{2}} + 2x^{\frac{1}{3}} - 3Y^{\frac{1}{2}}$.

VIII.

Solve the following equation:

$$\frac{\sqrt{x}-8}{\sqrt{x}-6} = \frac{\sqrt{x}-4}{\sqrt{x}+2}$$

IX.

Find the values of the unknown quantities in the following:

$$\left\{ \begin{array}{l} x^2 + y^2 + 4\sqrt{x^2 + y^2} = 45 \\ x^4 + y^4 = 337 \end{array} \right\}$$

X

The difference of two numbers is 15, and half their product equals the cube of the smaller. What are the numbers.

American Literature.

[HAMILTON.]

- I. Write a short connected account of the Author of Snow-bound, giving what you know of him as a man and his contribution to literature.
- II. Write a concise description of some interesting scene in the Legend of Sleepy Hollow.
- III. Tell the legend upon which Lowell bases his vision of Sir Launfal.
- IV. Make an outline of the principal works of Oliver Wendell Holmes, classifying them as prose and poetry.
- V. Sketch briefly one of the leading characters in Longfellow's Evangeline.
- VI. What class of subjects did Bryant usually select for his poems? Give two examples.
- VII. Name three Americans who have excelled as historians. As humorists. Name a work of each.
- VIII. Who wrote [1] Prince of India, [2] Poor Richards Almanac, [3] Old Oaken Bucket, [4] Story of a Bad Boy, [5] Bitter Sweet, [6] Man without a Country, [7] Biglow Papers, [8] Representative Men, [9] Farm Legends, [10] Rise and Fall of the Dutch Republic.
- IX. Characterize the writings of any one of the following Authors: James Fennimore Cooper, Louisa M. Alcott, Ralph Waldo Emerson.

Zoology.

[STEERE.]

- I. [a] Define Structural Zoology.
[b] Define Distributive Zoology.
- II. [a] Give three differences to distinguish between plants and animals.
[b] What are omnivorous animals? Give an example.
- III. [a] Name the difference between spiders and other insects.
[b] Describe Neuroptera.
- IV. Draw and describe the circulation of blood in fishes, in reptiles, and in birds.
- V. [a] Describe the respiration of a bee.
[b] What were the first air-breathing vertebrates?
- VI. What is the relation of climate to the numbers and distribution of different kinds of life?
- VII. [a] Describe a compound eye.
[b] What animals have compound eyes?
- VIII. Describe the metamorphosis of the tadpole.
- IX. [a] Explain the locomotion of a common Squid in water?
[b] A Lobster?
- X. What are the distinctions between nocturnal and diurnal birds of prey?

General History.

[HAMILTON.]

- I. Who was Abraham? Cyrus? Confucius? Zoroaster? Socrates?
 - II. Contrast the civilizations of Sparta and Athens.
 - III. Outline the main features of the religion of the ancient Greeks.
 - IV. Into what two great divisions were the free inhabitants of Rome divided? What rights had each respectively?
 - V. Explain the causes which led to the downfall of the Roman Empire.
 - VI. Describe briefly the Feudal System.
 - VII. State the causes and effects of the Crusades.
 - VIII. Review briefly the events and influences which led up to the French Revolution.
 - IX. What changes took place in the governments of European countries in 1870-71.
 - X. State the issue and the result in each of the following battles: Marathon, Chaeroula, Tours, Hastings, Sadowa.
-

Political Economy.

[REID.]

- I. Define Political Economy.
- II. Distinguish between the price and value of a commodity.
- III. What determines the market value of any commodity?
- IV. If the demand for any article increases and the supply remains the same, what is the result?
- V. Give the motive that underlies exchange.
- VI. Should a government interfere with the freedom of exchange?
- VII. [a] What is the influence of monopolies?
[b] Patents and copyrights are monopolies. Should they be allowed?
- VIII. What are the advantages and disadvantages of a division of labor?
- IX. Distinguish between wealth and capital.
- V. [a] What is money? [b] Interest? [c] Credit?

Botany.

[HAMILTON.]

- I. Describe the process of germination.
 - II. Name all of the differences between endogens and exogens.
 - III. What are the functions of the leaves?
 - IV. Make a drawing of a complete flower. Name all of the parts.
 - V. State the essential difference between cryptogams and phaenogams; between roots and stems.
 - VI. Explain two ways in which forests influence the water supply of a country.
 - VII. Make an outline of leaves as to [1] veining, [2] form, [3] margin, [4] apex, [5] base.
 - VIII. Explain fully the system of naming plants. Give two illustrations.
 - IX. Give directions for preparing and mounting specimens for an herbarium.
 - X. Describe three ways in which plants may be propagated.
-

Geology.

[STEERE.]

- I. Define dynamical, structural and historical geology.
- II. [a] What is rock in the geological sense?
[b] Account for the stratified condition of rocks.
- III. [a] Locate the mesozoic era in geological time and tell of its characteristics.
[b] Name the periods into which the era is divided.
- IV. [a] Name the subdivisions of the palaeozoic era.
[b] Account for petroleum and bitumen.
- V. [a] What do you understand by purification?
[b] Tell what is meant by joints, fissures and veins.
- VI. What is the theory as to the causes of volcanoes, earthquakes and geysers?
- VII. [a] How are limestone caves formed?
[b] Account for coral reefs.
- VIII. Give the distinctive characteristics of orthoceratites, ammonites, and nautilus, and tell the era in which each existed.
- IX. Outline a map of North America in Cretaceous times.
- X. [a] Give two ways in which glacial lakes are formed.
[b] In which age did man first appear? Give some of his habits at that time.

Rhetoric.

[REID.]

- I. Define Rhetoric. Dictation. Syntax.
 II. What are the rhetorical qualities of a good sentence?
 III. Name the figures of speech.
 IV. In the following sentences, [a] What is the figure? [b] What things are compared? [c] Where does the resemblance lie?

“How far that little candle throws its beams,
 So shines a good deed in a naughty world.”

“Religion is to the soul what light is to nature.”

“Her hair drooped round her pallid cheek
 Like seaweed on a clam.”

“Kindness is the golden chain by which society is bound together.”

- V. Point out and name the figures of speech in each of the following sentences:

“Here once the embattled farmers stood,

And fired the shot heard round the world.”

“His library contains Dickens, Scott and a host of other novelists.”

- VI. Punctuate the following sentences giving reasons for the use or omission of the comma:

“The books which help you most are those which make you think most.”

“He had hopes, fears, and longings, which his friends could not share.”

VII. Give the essential points of a good letter.

VIII. Write a short letter to a relative.

- IX. Fill the blanks in the following sentence using the words given below best suited to express the meaning:

[extended, increased, enlarged.]

“the teacher's intellectual requirements will be———, his field of usefulness———. and his mental horizon——— by the study of psychology.”

- X. Write a periodic sentence, and reconstruct it into the form of a loose sentence.

Respectfully submitted.

J. E. RICKARDS,
 H. J. HASKELL,
 E. A. STEERE,
 J. E. MORSE,
 T. E. COLLINS,
 J. M. HAMILTON,
 H. H. GRANT,
 PETER WINNE,
 O. F. GODDARD,
 JAMES, REID,
 J. A. BAKER.

Clerk of the Board:

CAMERON, C. WYLIE.

UNIVERSITY OF MONTANA

PRESIDENT'S REPORT

THE EXECUTIVE COMMITTEE OF THE STATE UNIVERSITY.

J. H. T. RYMAN, Missoula President
HIRAM KNOWLES, Missoula
THOMAS C. MARSHALL, Missoula Secretary

THE FACULTY.

OSCAR J. CRAIG, A. M., PH. D., PRESIDENT,
Professor of History and Literature.

S. A. MERRITT, B. S.,
Professor of Chemistry and Physics.

CYNTHIA ELIZABETH REILEY, B. S.,
Professor of Mathematics.

W. M. ABER, A. B.,
Professor of Latin and Greek.

FRED. C. SCHEUCH, M. E., A. C.,
Professor of Modern Languages, and Temporarily in Charge of the Department
of Mechanical Engineering.

*MORTON C. ELROD, M. S.
Professor of Biology.

MRS. WALTER WHITAKER,
Instructor in Music.

ELOISE KNOWLES,
Assistant in the Preparatory Department.

MARY A. CRAIG, B. S.,
Librarian.

*To take charge of the Department Feb. 1, 1897.

PRESIDENT'S REPORT.

Missoula, Montana, November 30, 1896.

To the Montana State Board of Education,

Helena, Montana:

Gentlemen: In accordance with Section 5 of "An Act to establish, locate, maintain and govern the University of Montana," the following report for the year ending November 30, 1896, is respectfully submitted.

THE FACULTY.

The Executive Committee of the University acting in accordance with your instructions have elected Morton C. Elrod to the chair of Biology, and have appointed Mrs. Walter Whitaker Instructor in Music in place of Miss Mary Olive Gray, resigned.

Mrs. Whitaker began her work in September at the opening of the college year and Professor Elrod will take charge of his department at the beginning of the second semester.

On account of the large number of students in attendance and limited number in the Faculty, it had been found necessary to employ some assistance in English, Drawing and Mathematics. The attempt has been made to do this with as little cost as possible consistent with good work. The constantly increasing number of students as well as the multiplication of classes arising from the regular advancement of students will make the appointment of additional instructors imperative at an early date.

DEPARTMENT OF HISTORY AND LITERATURE.**OSCAR J. CRAIG, PROFESSOR.**

The work done by the students in this department has been quite satisfactory. The aim has been to provide such instruction as will not only give the student a knowledge of the subjects taught but also train him in methods of study and research.

Instruction has been given in the following subjects: General History of the United States, Civics of the United States and of Montana, English Grammar and Composition, Rhetoric, and Literature. The work in English Grammar and Composition and a part of the work in United States History has been done by Assistants.

At the present time in addition to the office and executive work that fall to the Professor in this department as President of the University, he is caring for four classes; two in History one in Rhetoric and one in Literature. It will be necessary that an Instructor be given this department next year.

The number in the several classes for the year ending Nov. 30, 1896, has been as follows: General History 25; History of the United States 30; Civics 45; Rhetoric 55; English Grammar and Composition 33; Literature 26.

THE DEPARTMENT OF CHEMISTRY AND PHYSICS.**S. A. MERRITT, PROFESSOR.**

This department began work with a very fair equipment in the way of material and apparatus. Many students have availed themselves of the facilities offered for doing work in Chemistry and Physics. There has been a marked improvement in the character of the work done as well as in the application of it. Apparatus and material has been added during the year. Among the additions to the Chemical Laboratory might be named: weights of precision, platinum crucibles and other platinum vessels. Also some other apparatus necessary for quantitative work.

In Physics the apparatus added which deserves especial mention is as follows: A standard barometer, a glass tank for the refraction and total reflection of light, Jolly's specific grav-

ity balance and also an eight inch induction coil and Crook's tubes.

The number of students enrolled in Chemistry for the year ending November 30, 1896, is 13, in Classes in Physics 38, Physical Geography and Physiology have also been taught by the Professor in charge of this department. 30 students took work in Physical Geography and 38 in Physiology. Special students in Chemistry and Assaying 7.

THE DEPARTMENT OF MATHEMATICS.

CYNTHIA ELIZABETH REILEY, PROFESSOR.

The progress of the department during the year has been quite gratifying. Students in classes represented last year are with few exceptions, better prepared and working more earnestly and intelligently, while those in the higher classes are doing good thorough work. Within the current year the department has been supplied with an excellent set of surface and solid mensuration forms. In addition to these, students have been required to construct apparatus illustrating many principles and original propositions in Geometry. The department needs more illustrative apparatus such as spherical blackboards, sets of weights and measures, etc. The apparatus needed for practical field work in surveying must soon be provided.

The enrollment for the current year is as follows: Arithmetic 66; Algebra 94; Plane Geometry 38; Solid Geometry 18; Higher Algebra 4.

THE DEPARTMENT OF GREEK AND LATIN.

W. M. ABER, PROFESSOR.

In the development of the University during the past year this department has kept pace with other departments, both in respect to the number of students enrolled and in the higher grade of work done. The number entering this year with some preparation in Latin is much larger than it was last.

Owing to the change in the curriculum which advanced beginning Greek from the Second Preparatory to the Freshman year, no beginning class was organized this year.

Since the last report the material for illustration and instruction has been increased by the addition of a collection of excellent photographs imported from Greece and Italy; and of lantern slides made from some of these photographs and from other sources. Also a number of the best works of reference have been purchased by the library for this department. These add greatly to the means of instruction in Greek and Roman Literature, Art, and Archaeology.

Additional supplies of books, photographs, and lantern slides will soon be needed and a small sum expended in this way will render great returns. The most pressing need of the department is additional teaching force. Without such assistance it will be impossible to provide for the increasing number of students and of classes as higher work is called for.

The total number of students enrolled in the department for the year ending November 30, 1896, is 111, all of whom are pursuing Latin and 3 are pursuing Greek also.

THE DEPARTMENT OF MODERN LANGUAGES.

FREDERICK C. SCHEUCH, PROFESSOR.

The work in French consists of two classes. The first year students are using Chardenal's Grammar. The second year students have read some of Daudet's works, Souvestre's Confessions d'un Ouvrier, two of Victor Hugo's plays and Merimee's Colomba.

The work in German consists of two classes. The first year students are using Joynes Meisner's Grammar and Joyne's Reader. Second year students have finished both Grammar and Reader and have been reading. Schiller's Der Neffals Onkel, Freytag's Aus den Staate, Friedrich's des Grossen, and Schillers' William Tell.

The members of the class in Spanish are using Edgren's Grammar.

The number of students in the different classes has been as follows: French 11; German 23; Spanish 5.

THE DEPARTMENT OF MECHANICAL ENGINEERING.

....., INSTRUCTOR.

This work was in last years report included under the heading of Applied Science. This department of Applied Science included the work in Practical Mechanics on which the Mechanical Engineering course is based, Assaying, Surveying and some other features. The Assaying has been attached to the department of Chemistry, the Surveying to the department of Mathematics and the Mechanical Engineering made a separate department.

No further equipment has been added to this department since last report. More room is needed to develop the work of this department and no farther equipment can be added until it is provided. The work in Pattern Making, Moulding and Casting, and Forging will be done this year in the Foundry and Machine Shops of the Missoula Iron Works the proprietors having generously tendered the use of these to the University.

Excellent work has been done by the students in this department. The present Freshman class has in addition to the work not technical, finished the first year of shop-work, and also covered the course laid out in Mechanical Drawing, including Drawing from copy, Inking, Cross Hatching, and Tinting.

Besides the additional material and machinery needed in this department there should be added to the Library a set of reference books on Engineering and also some Engineering periodicals such as "Steam Power" etc.

The total number in the Mechanical course during the year has been 11.

THE DEPARTMENT OF BIOLOGY.

MORTON J. ELROD, PROFESSOR.

This department was separated from the general department of Natural Science at the beginning of this current year and Morton J. Elrod elected to take charge of it.

Professor Elrod will assume control of the department at the beginning of the second semester in February, 1897. He

will bring to the department a large amount of material that he has already collected in addition to many valuable books and reports that will furnish the nucleus of a department library. This department already has a creditable equipment as shown in the report of last year, but little has been added this present year except in the way of specimens and material for the use of the laboratory.

THE DEPARTMENT OF MUSIC.

MRS. WALTER WHITAKER, INSTRUCTOR.

Miss Mary Olive Gray who had charge of this department last year resigned in September and Mrs. Walter Whitaker was appointed to fill the vacancy. In addition to the classes in Instrumental Music and Voice Training a Choral Union composed of regular students of the University and others not students but residents of Missoula has been organized and is being successfully conducted.

The number of students in this department exclusive of the Choral Union is 25.

The circular concerning the department of Music and which is attached to this report was issued at the beginning of the year.

SUMMARY OF ENROLLMENT.

The total enrollment for the college ending June 10, 1896 was 135.

The total enrollment to November 30, 1896 for the year 1896-7 is 146, this shows an increase of eleven over the total enrollment of last year. With the same percentage of increase during this year as was enjoyed last year we may confidently expect this college year's enrollment to reach 160.

The enrollment by classes for the year ending November 30, 1896, is as follows:

Arithmetic, 66.	German 23.
Algebra, 94.	French, 11.
Plane Geometry, 38.	Spanish, 5.
Solid Geometry, 18.	Mech. Drawing, 11.
Higher Algebra, 4.	Shop Work, 11.
Chemistry, 13.	General History, 25.
Physics, 38.	U. S. History, 30.
Assaying, 7.	Civics, 45.
Physical Geography, 38.	Rhetoric, 55.
Physiology, 38.	English Grammar and Composition, 33
Latin, 111.	Literature, 26
	Greek, 3.

THE LIBRARY.

MARY A. CRAIG, LIBRARIAN.

The room devoted to the use of the Library is well lighted and ventilated. The books are kept in open cases so as to be the more accessible to Librarian and student. The books are divided into two classes, those that are marked Reference and are not to be taken from the room, and those that may be taken from the room in accordance with the Library regulations. Within the present year 566 volumes have been added.

In building up the Library the aim has been to add from time to time such works as are needed by the students at present. And so the purchases have been of standard works in History, Literature Sciences, etc. Care is taken in all cases to secure good substantial binding and clear type. By making the selections in this way no useless rubbish will be accumulated or unnecessary expense incurred.

Quite a number of private individuals have placed books in the Library either as loans or donations among these contributions deserving of special mention is a valuable collection of Mediaeval manuscripts and books. Some of these date back as far as the eleventh century. These were collected from some of the old monasteries of Spain and are donated to the Library by Professor Scheuch. A collection of valuable books mostly in German and French has been donated by Mrs. Waller.

Application has been made to the proper bureaus at Wash
—3

ington and the principal government publications are now regularly received. In this connection the interest and good offices of the Montana Congressional Delegation is gratefully acknowledged. Each member has taken an active part in securing the government publications for the University.

A number of the leading magazines and periodicals are kept on file for the use of students. There are also a number of the leading newspapers of Montana. These are for the most part donated by their respective publishers. Their courtesy in thus sending their papers to the Literary is hereby thankfully acknowledged. Complete files of the newspapers and periodicals are preserved for future reference.

The total number of bound volumes in the Library is 1383. The total number of pamphlets unbound is 167.

A number of new cases must soon be added to the equipment of the Library and Museum in order to properly protect and classify the books and other material.

THE GENERAL PROGRESS OF THE UNIVERSITY.

The general progress of the University has been in the main quite satisfactory. The increase in enrollment has been gratifying but still more so has been the fact that the incoming students are better prepared for their work and consequently the work of all has been greatly improved. This improvement in preparation is due to the efforts already being made by the schools of the state in the direction of getting the course of study in the public schools in line with that of the University so as to prepare those who complete public school work for some definite place in the University course.

The action of last year in establishing accredited High Schools is already beginning to bring about desired results. In many cases where the High School courses are not complete the work is still so planned as to prepare the applicant for advanced standing in the Preparatory Department.

There have been a number of contributions to the Museum, among which as especially interesting may be mentioned, spe-

cimens of petrified moss found in Missoula County and presented by Mr. Schmidt of Missoula, and three golden eagles presented by Mr. Amos Buck of Stevensville.

Two Literary Societies have been organized, the Clarkia and the Hawthorne. The former is composed of young women of the University and the latter of young men. Both hold meetings regularly and are doing good work.

Dr. J. J. Buckley of Missoula has founded in memory of his father what is to be known as the H. N. Buckley oratorical contest. A prize of twenty dollars is to be awarded annually to the one preparing and delivering the best oration. The conditions of the contest are under the control of the Faculty.

An Athletic Association consisting of students and members of the Faculty has been organized for the encouragement and control of athletics.

A branch of the Young Men's Christian Association has also been organized by the students and has quite a large membership. The circular to teachers which you approved at your December meeting was issued about December 25, and as a result a number of teachers from different parts of the state entered the University and were greatly benefited by their work.

BUILDINGS AND GROUNDS.

We have continued to use the building placed at your disposal by the citizens of Missoula. It has proved to be convenient and well arranged but is not large enough to provide comfortably for the increased number of students enrolled this year. Neither is there room for conveniently arranging the material that has been gathered for the use of the different departments. More room is needed to facilitate the work already in progress and every increase in the number of classes or in equipment adds a new demand.

The University Grounds have been enclosed by a neat and substantial fence. Shade trees have been planted to the number of five hundred. All except a very few of these are thriving. This work has been done by the Missoula Board of Trade

and without expense to the state. Arbor Day was observed as a day for tree planting. The Labor Organizations, other fraternal and civic societies as well as the students of the University and children of the schools took part in the exercises which were held on the University Grounds. A programme of the exercises is herewith transmitted.

In accordance with your instructions of June, 1896, plans for the general arrangement of the grounds and buildings have been prepared and are transmitted with this report. In the proposed arrangement of the grounds and buildings it has been the endeavor to make such a beginning that the needs of future years will not necessitate any reconstruction of the plan of buildings and campus: but to provide a systematic plan that may gradually be developed as the necessities of the Institution and the amount of income will justify. Our plans should look to the future and yet be in such shape as will best accommodate the needs of the present.

It is of the greatest importance that steps be taken at once to the erection of permanent buildings on the University grounds.

**FINANCIAL STATEMENT FOR THE YEAR ENDING
NOVEMBER 30, 1895.**

EXPENDITURES.

Equipment.....	\$ 4,777 15
Supplies	75 95
Freights and Drayage.....	394 10
Printing, Advertising and Stationery.....	329 32
Improvements and Repairs.....	193 00
Labor.....	107 28
Insurance.....	66 00
Traveling Expenses and Postage.....	200 00
Land Agent's Commission.....	13 00
Salaries.....	2,806 65
Total.....	\$8,962 45

RECEIPTS.

From the University Income Fund.....	\$ 8,962 45
Matriculation fees paid into the Library Fund.....	\$ 555 00

FINANCIAL STATEMENT FOR THE YEAR ENDING
NOVEMBER 30, 1896.

EXPENDITURES.

Equipment	\$ 1,622 25
Supplies.....	472 02
Improvements and Repairs.....	172 76
Freights, Expressage and Drayage	258 21
Printing, Advertising and Stationery	379 15
Traveling Expenses and Postage.....	229 00
Land Agent's Commissions.....	12 50
Salaries.....	9,385 82
Total.....	————— \$12,531 71

RECEIPTS.

From Legislative Appropriation.....	\$ 7,500 00
From the University Income Fund.....	5,031 71
	————— \$12,531 71

Matriculation fees paid into the Library Fund..... \$ 1,020 00

AVAILABLE FUNDS

Remaining in the Income Fund.....	\$10,294 74
Remaining in Library Fund.....	1,575 00
	————— \$11,869 74

Respectfully submitted,

OSCAR J. CRAIG,

President.

STATE

AGRICULTURAL COLLEGE

REPORT OF EXECUTIVE BOARD

Report of Executive Board

Bozeman, Montana, December 5, 1896.

The Hon. State Board of Education:

Gentlemen: Since our last report the following changes have been made in the faculty:

Chair of Biology; Mr. Thos. A Williams declined the position, having received an appointment in the U. S. Department of Agriculture. In his place was elected E. V. Wilcox, Ph. D. at a salary of \$1,500.00.

Domestic Science: Mrs. E. Owens was elected at a salary of \$800.00.

Assistant in Preparatory Department: Miss May Travis was elected at a salary of \$800.00.

Assistant in Business Department: Miss J. Jones having resigned to get married, Miss Stella E. Shaff was elected to the position at a salary of \$600.00.

Veterinary Department: Dr. Williams resigned to accept a professorship at Cornell University. His place has not yet been filled, as it proves very difficult to secure a suitable man. There are plenty of horse-doctors, and competent veterinary surgeons may be found without much difficulty; but the work here being mostly in the line of original investigation, it is useless to employ a man who is not a competent bacteriologist, and such a one we have yet been unable to find.

In addition to the regular estimate, approved at your June meeting, we submit the following extraordinary estimate for additional equipment, viz:

Physical, Chemical and Electrical Apparatus	\$3,800 00
Machinery for shops	4,200 00
Apparatus and Supplies for Biological Department.....	1,000 00
Apparatus for Dep't. of Agriculture and Engin.	1,000 00
Library.....	2,000 00
Total.....	\$12,000 00

We have on hand a reserve of some \$15,000.00, available for this estimate, and as our buildings will be completed in the spring, we deem that the time has come, when this money can be expended to advantage in securing more complete equipment. We ask your approval of this estimate now, as the machinery building is ready for occupancy now, and of the other apparatus much has to be imported and must be ordered at least six months ahead. As President Reid will be present at your meeting, we deem it needless to go more into detail, as he can furnish you any additional information you may desire. This estimate has been approved by him and the faculty.

The President's report which will be submitted to you gives you full information in regard to the work of the College and Experiment Station. I think we may say without qualification that the changes made in the faculty and staff have been in every instance for the better and have resulted in more efficient and more harmonious work.

The buildings are progressing, although not as rapidly as we have wished. We have used every effort to push the work, and it is probably needless to rehearse to you all the obstacles we have had to overcome. Your President is thoroughly familiar with all our difficulties.

The Machinery building and Drill hall are practically completed. The Veterinary building is under roof. Another week's good weather will make the Chemical building ready for the roof. The foundation of the Main building is completed. Even if winter should set in in earnest and work be stopped entirely, everything is in good shape to be laid away until spring.

After repeated advertising and then getting private bids we have let the Plumbing contract to Merrs. Boyle & Rich, of this city for the sum of \$6,270.50.

As the original contract did not provide for floor, ceiling, etc., in the Machinery building we have authorized the fitting up of same for the reception of machinery at an expense of not exceeding \$860.00. The work is done under the supervision of Prof. Williams who is a practical builder and will cost us much less than the building contractor was willing to do it for.

As the new buildings will necessarily require a larger ex-

penditure than heretofore for fuel, janitor service and the like, which cannot be paid for from the federal appropriation, we felt that we must ask the legislature, when it meets, for an annual appropriation of \$10,000.00. Mr. Reid will explain to you more fully our views in the matter. We should be glad to have the endorsement of your Board for such application.

We ask then your approval of the following matters, viz:

1. The new appointments at the salaries stated.
2. The extraordinary estimate submitted.
3. The Plumbing contract.
4. The appropriation for the fitting up of the Machinery building.

All of which is respectfully submitted,

By order of the Executive Board,

PETER KOCH,

Secretary.

REPORT OF STATE

BOZEMAN, MONT., November 30, 1896.

Peter Koch, Treasurer, In account with Montana Agricultural College.

DR.

CR.

1896

May 31	To cash on hand.....	\$18,902 42	By Salaries.....	\$10,246 65
	" Fed. Appr. Ex. St....	11,250 00	" Library.....	454 01
	" " " College....	22,000 00	" Sci. Appar. and Supplies	1,045 13
	" State Appr.....	953 22	" Implem and H'der.....	494 03
	" College Fees, Etc....	1,133 15	" Labor.....	2,307 63
	" Sale of Produce.....	552 42	" Live Stock.....	239 95
			" Water.....	105 75
			" Bulletins and Stat'y.....	444 33
			" R. R. Frt. and Exp.....	176 49
			" Sundries.....	265 36
			" St. Appr. Bills.....	1,129 86
			" Balance.....	37,882 02
		<hr/>		<hr/>
		\$54,791 21		\$54,791 21

Nov. 30 To Balance..... \$37,882 02

BOZEMAN, MONT., November 30, 1896.

Peter Koch, Treasurer, In account with Building Acct. Montana Agricultural College.

DR.

CR.

1896

May 31	To Balance on hand.....	\$57,661 04	Nov. 30 By Suiter, Est., No 3, Voucher 1A \$ 31 221 00
	By amt. brought up.....	11,027 35	" Paulsen..... 1.... 123 35
	" Armicle..... Vou. 20	5 00	" Standard..... 2.... 18 50
	" H. B. & St. Co....	21 6 85	" Independent..... 3.... 12 50
	" Suiter Est. No. 5....	22 5,400 00	" Impr. Bull..... 4.... 5 00
	" Paulsen.....	23 112 40	" Cooper..... 5.... 13 15
	" Morris.....	24 112 11	" Benson..... 6.... 5 75
	" Bayler R.....	25 2 80	" Brown..... 7.... 31 25
	" State P. Co.....	26 36 00	" H. B. & St. Co..... 8.... 14 30
	" Suiter Est. No. 6....	27 8,500 00	" State P. Co..... 9.... 36 00
	" Paulsen.....	28 115 15	" Lenz..... 10.... 10 50
	" Yerkes.....	29 8 20	" Paulsen..... 11.... 116 65
	" Brown.....	30 35 25	" Suiter Est No. 4..... 12.... 8,100 00
	" Suiter Est. No. 7....	31 2,454 46	" Morris..... 13.... 19 00
	" Morris.....	32 135 00	" Morris..... 14.... 197 50
	" Paulsen.....	33 125 55	" Paulsen..... 15.... 100 00
	" Paulsen.....	34 126 80	" Peck, W., Est. No. 1
	" Suiter Est. No. 8....	35 2,000 00	16.... 3,960 00
	" Balance.....	27,458 12	" Cooper..... 17.... 26 50
		<hr/>	" Morris..... 18.... 5 25
			" Morris..... 19.... 115 00

\$57,661 04

Amt. carried up..... \$11,027 35

Report of President

Bozeman, Montana, Dec. 1st, 1896.

To the Executive Board, College of Agriculture and Mechanic Arts:

Gentlemen: I have the honor to submit to you my annual report together with the reports of the various departments.

The work of the current year has been very satisfactory. Various changes approved by you in courses have been carried into effect, and they have brought forth excellent results already. The most important of these was the extension of the Preparatory course to three years. This will enable us to make more thorough preparation for work in the College, and to give to those who cannot afford the time and expense for a college course a good general education. The first year is given to the common branches of an English education, and Latin, Algebra, History and elementary work in Science are begun in the second year. The third year is given to Rhetoric, Physics, Chemistry, Geometry and Latin or Drawing. The work in all subjects is made as practical as possible. In the sciences students are required to apply the principles in the laboratory which have been brought to their attention in the text-book and class-room. The object kept in view is to develop the faculty of observation and through the manipulation of apparatus, to develop the practical faculty also. To this end every department has its laboratory equipped as far as means and facilities will permit. The students show a decided improvement both in powers of application and habits of study. With few exceptions, the moral tone and general conduct are all that could be desired.

There are now three literary societies, one for ladies and two for gentlemen, with a membership of about eighty. These are all under the supervision of the faculty, members of which are present at all meetings to aid in the work by criticism and suggestion.

All students who are not members of these societies are required to take some form of rhetorical work weekly.

The changes in the faculty and the additions have resulted in greater efficiency in all the departments.

W. H. Williams, M. E., a graduate of Wisconsin University in Mechanical Engineering, has charge of that department, and shows that he is thoroughly competent.

Mrs. Eliza Owens has charge of the new department of Domestic Science and Art. An elaborate course has been arranged extending over two years and covering the field of sewing, cooking and the various culture and practical subjects which combine to make the intelligent house-keeper. Mrs. Owens comes from the State College of Iowa with the highest testimonials after a service of eight years.

A room has been fitted up in the Ferris Block and furnished and the work has begun under very promising conditions.

Miss Mary Travis, a graduate of the University of North Dakota, and for several years a successful teacher in the city of Portland, Oregon, acts as Assistant in the Preparatory Department and in Mathematics. She is proving herself an efficient instructor.

E. V. Wilcox, Ph. D., of Harvard University, has taken charge of the new department of Biology and has shown himself thoroughly competent.

Prof. Beach has the field covered by Prof. Ryan and Prof. Luther Foster, resigned. He is a graduate of the State College of Colorado. His report shows the practical character of the work he has planned to carry out.

Miss Mabel Ruth Owens succeeds Miss Jones as Librarian and is doing very good work in cataloguing and arrangement. Special efforts are being made to develop in the students a love for reading of good standard literature.

Miss Owens takes charge also of the class in Physical Culture and gives aid in Rhetorical work.

Prof. W. F. Brewer succeeds Prof. Maiden in English, History and Latin. He is a graduate of Grennell College, Iowa, and a Fellow of Chicago University. He is doing superior work in the various classes of which he has charge.

Miss Stella Shaff has charge of Stenography and Typewriting.

Your attention is called to the accompanying reports of heads of departments for a more detailed account of the work.

THE LIBRARY.

The library has been changed during the year to a smaller room and suffers from limited space. Many new books have been added during the year, including works in Literature, History and Science. The list of current journals and magazines has been increased in Engineering. A large number of daily papers are kept on file. Efforts are being made to secure series of journals in Chemistry and Agriculture as works of reference. About one thousand dollars have been expended in books and magazines. A paper is issued monthly by the students, known as the College Exponent.

There have been enrolled during the present term 146 students. Of these 12 are in College courses, 27 are taking special courses in Academic work, 40 are in the regular Preparatory course, 25 in the Commercial course, 8 in Stenography and Typewriting, 2 in Art and 32 in Music.

JAMES REID,

President.

State School of Mines

Anaconda, Montana, December 10th, 1896.

The State Board of Education,

Helena, Montana.

Gentlemen: In compliance with the bill establishing the Montana State School of Mines, which provides that the Chairman of the Board of Trustees shall on or before December 10th, of each year, make a report to the State Board of Education, of the prosperity and condition of the School, with a statement showing its receipts and disbursements, and such statistical or other information, as in the judgment of the Board may be deemed important or useful. I beg leave to submit the following brief report:

The wording of the statute defining the duty of the chairman in the matter of an annual report, seems to apply to the School, only when it is in active operation, and not during its construction. However a brief statement of the progress made in its construction may not be uninteresting, or out of place.

A contract for the erection of one wing of the building has been let, and work on the same is being pushed as rapidly as possible. The corner-stone will be laid with appropriate ceremonies on December 29th. By the terms of the contract the building is to be finished in August, 1897, subject to limited extensions for bad weather. The contract price of the building is \$88,456.85 of which \$46,390.50 has been paid to the contractors for labor and material. There are no receipts. The site of the school is on a commanding elevation, immediately west of and adjoining the city limits of Butte, and is convenient of access, while sufficiently removed from the business portion of the City.

The long delay in starting the school, was occasioned by a lack of funds. The assets of the school are ample for a large and prosperous institution, consisting as they do, of 100,000

acres of timber and agricultural land, much of which is prospectively valuable, but not now available, owing to the fact that the government limited its selling price at \$10.00 per acre.

The Board of Trustees desires to take this occasion to testify to the cheerful and generous encouragement they have received in every move made to start the school. The public-spirited citizens of Butte donated valuable ground for a site, the State Board of Education, of which the Governor, Attorney General and Superintendent of Public Instruction are ex-officio members, has been active and untiring in its aid and co-operation; the architect has done valuable work, for a nominal consideration; the contractors accepted warrants which are negotiable only at a discount; all the people of Montana, directly or indirectly interested in mining, and who is there in the State that is not, look forward with pleasurable anticipation to its completion, and it is confidently expected that the legislature will cheerfully and promptly appropriate all necessary funds for its maintenance.

In the judgment of the Board of Trustees no more important educational institution has been, or will be built in Montana, than the Montana State School of Mines, and none is more worthy of generous support.

Yours very respectfully,

F. E. SARGEANT,

Chairman.



